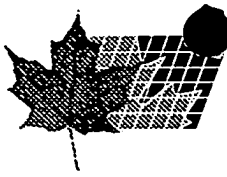


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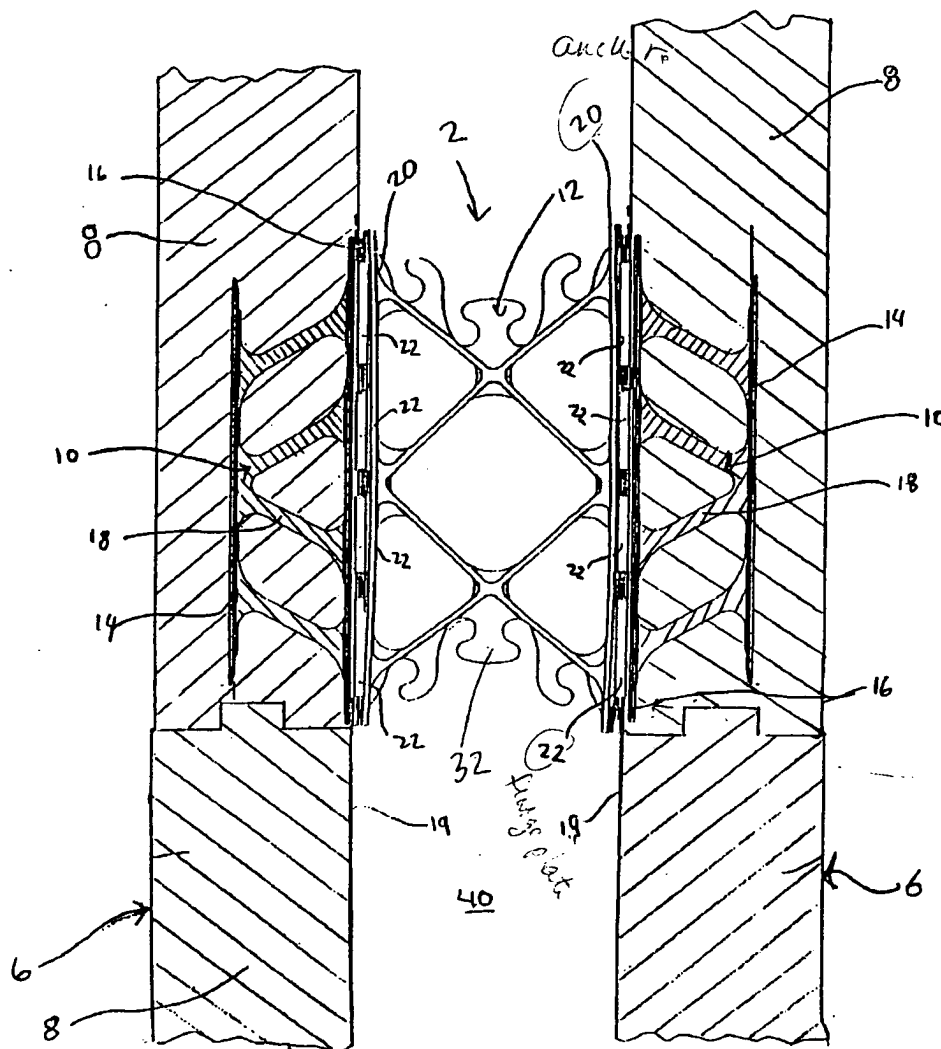
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(54) **BLOC DE BETON POUR MUR ET RACCORDS**

(54) **CONCRETE WALL FORM AND CONNECTORS THEREFOR**



Industrie Canada Industry Canada

**CONCRETE WALL FORM AND CONNECTORS THEREFOR****FIELD OF THE INVENTION**

The present invention relates generally to wall forms of the type comprising pairs of opposed form walls each formed of a plurality of stacked rows of plastic foam panels for receiving flowable materials such as concrete. More particularly, it relates to connectors used to maintain said form walls in spaced and parallel relationship.

**BACKGROUND OF THE INVENTION**

A number of different systems and method currently exists for making insulating forms for casting a concrete wall. Generally, these systems comprise pairs of opposed form walls generally made of a rigid foam like polystyrene which defines concrete-receiving cavities therebetween. Once the concrete is solidified, the form walls remain in place to insulate the wall. Those form walls are typically maintained in spaced and parallel relationship before the pouring of concrete by means of connectors comprising a pair of parallel lateral attachment flanges each embedded in one of the two opposed form walls, and a connecting web interconnecting the flanges.

Known concrete forms with the desirable rigidity are conventionally manufactured in the factory and are then shipped on the site of construction to be installed onto the ground to be treated with the inherent risk of damage during transportation or installation, particularly, since known pre-assembled form walls are fragile due to the important empty volume existing between the form walls.

In other conventional methods, forms satisfying the requirements of rigidity are installed directly on the site. However, they are complex and expensive, since the numerous components of the latter forms render assembly time consuming.

There is still presently a need for a wall form that will be easy to handle, to ship and to install on the site of construction and that will be low in cost.

## SUMMARY OF THE INVENTION

An object of the present invention is to propose a foam plastic wall form that will satisfy the above-mentioned need, and more particularly, connectors therefor which overcome the drawbacks of the presently available methods and apparatus for making wall forms.

A further object is to provide a wall form which can be completely pre-assembled at the factory and which is as easy to transport to the site of construction as disassembled prior art wall forms.

In accordance with the present invention, these objects are achieved with a connector for tying together opposed form walls in spaced and parallel relationship to make a form for receiving a flowable material such as concrete, the connector being characterized in that it comprises :

- opposed left and right parallel bearing elements each adapted to be embedded in a corresponding form wall; and

- a web member having a left end hingely connectable to the left bearing element and a right end hingely connectable to the right bearing element,

whereby once the connector is installed, the opposed tied form walls are compactly foldable with respect to one another.

The present invention is also directed to a wall form comprising opposed form walls disposed in spaced and parallel relationship to make a form for receiving a flowable material such as concrete and a plurality of connectors as described above tying the wall forms together.

A wall form according to the present invention can be easily manufactured, compacted and stored without requiring a lot of space or transported to the site of construction. Due to the relatively light weight of the material used for the manufacture of the elements of the wall forms and due to the fact that these elements can be packed in a compact form, a wall form according to the present invention is a lot less fragile

during shipping than prior art pre-assembled wall forms, the freight costs for transportation are significantly reduced and the time required to install the form on the site is also significantly reduced as the form is already assembled.

Other features and objects of the present invention will become more apparent from the description that follows of a preferred embodiment, having reference to the appended drawings and given as examples only as to how the invention may be put into practice.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

Figure 1 is a cross-sectional side elevational view of a pair of panels tied with a preferred embodiment of a connector according to the present invention;

Figure 2 is a top view of the panels of figure 1 showing the panels folded on each other for transportation purposes;

Figure 3 is a perspective view of the connector shown in figure 1 without its right bearing element;

Figure 4 is a side elevation view of one of the bearing elements of the connector shown in figure 1;

Figure 5 is a front elevation view of the bearing element of figure 4;

Figure 6 is an enlarged top view of a joint between a web member and a bearing element in an open position and, a compacted position as dotted line;

Figure 7 is a side elevation view of the web member of the connector of figure 1;

Figure 8 is a side elevation view of one of the enlarged end portions of the web of figure 7 showing the details of a stopper at one end thereof;

Figure 9 is a perspective view of the web member of figure 7;

Figure 10 is a top view of the web member of figure 7; and

Figure 11 is a perspective view of a pre-assembled wall form according to a preferred embodiment of the invention.

### **DESCRIPTION OF A PREFERRED EMBODIMENT**

Referring to figure 1, the connector (2) is suitable for use with a concrete-wall form (4) of the type comprising a pair of form walls (6). Each form wall (6) is formed of a plurality of stacked horizontal rows of coplanar substantially rectangular foamed plastic panels (8). The panels (8) are abutting one another along horizontal and vertical edges thereof. A plurality of connectors (2), as shown in figures 1 and 11, are used to maintain the form walls (6) in spaced and parallel relationship.

As illustrated in figure 2, thanks to the specific characteristics of the connector according to the present invention, the panels (8) once tied with the help of those connectors (2) are easily foldable with respect to one another and thus can be shipped to the site of construction in a well compacted form. In figure 2, three of those connectors are illustrated.

Referring also to figure 3, the connector (2) comprises a pair of parallel lateral bearing elements (10), a right one and a left one (not illustrated in figure 2), and a web member (12) interconnecting the bearing elements (10). Each of the bearing elements (10) comprises an inner plate (14), an outer plate (16) and a connecting plate (18) connecting the inner plate (14) to the outer plate (16). In the making of a foam panel (8) in the manufacturing plant, the plastic foam material forming the panel (8) is injected to surround the bearing element (10) such that the outer plate (16) of each of the bearing elements (10) is abutting the inner surface (18) of the panel (8), as shown in figure 1, and the inner plate (14) is engaged in the panel (8), thereby strengthening the joint between the panel (8) and the connector (2).

The outer plate (16) of each of the bearing elements (10) is hingely connected to a corresponding end (20) of the web member (12). More particularly, referring also to figures 4 to 6, the outer plate (16) comprises a plurality of aligned open tube-like knuckles (22) disposed therealong. Each knuckle (22) has a pair of opposed edge

portions (24) forming an opening (26). All the openings (26) of a single outer plate (16) are in registry to each other.

Referring now also to figures 8 and 10, each end (20) of the web member (12) has an enlarged end portion (28) and a plastic strip (30) connecting the enlarged end portion (28) to the central portion (32) of the web member (12). As best seen in figure 3, the enlarged end portion (28) is sized to be slidably insertable in the open tube-like knuckles (22) and the plastic strip (28) is provided with a plurality of aligned slits (34) each adapted to receive an edge portion (24) of a corresponding tube-like knuckle (22) to allow the turning or pivoting of the web member (12) with respect to the bearing element (10). Preferably, the enlarged end portion (28) is also provided therealong with a plurality of small holes to lighten the web member (12).

As can be appreciated, the preferred embodiment of the present invention illustrated comprises four of those knuckles (22) on each bearing element (10) having four corresponding slits (34) provided on the web member (12). Another embodiment of the present invention may have a different number of those knuckles and slits.

As best seen in figure 6, each tube-like knuckle (22) defines an inner tube (36) adapted to receive an enlarged end portion (28) of a corresponding web member (12). The inner tube (36) and the enlarged end portion (28) may have a circular shape, as illustrated in figure 3, for example. However, in order to prevent the panels from moving like a jumping jack during the shipping or the installation on the site, the inner tube (36) and the enlarged end portion (28), which are preferably made of a slightly flexible plastic, preferably have a shape which allows those elements to be somewhat locked in the open or compacted position. More preferably, the inner tube (36) and the enlarged end portion (28) both have a rectangular section with rounded corners, as shown in figure 6. As can be appreciated, that particular shape prevents the enlarged end portion (28) from pivoting freely in the inner tube (36) of the knuckle (22). Therefore, a certain force has to be applied to the assembly to bring it from the compacted position, as in figure 2, to the open position, as in figure 1, or vice versa.

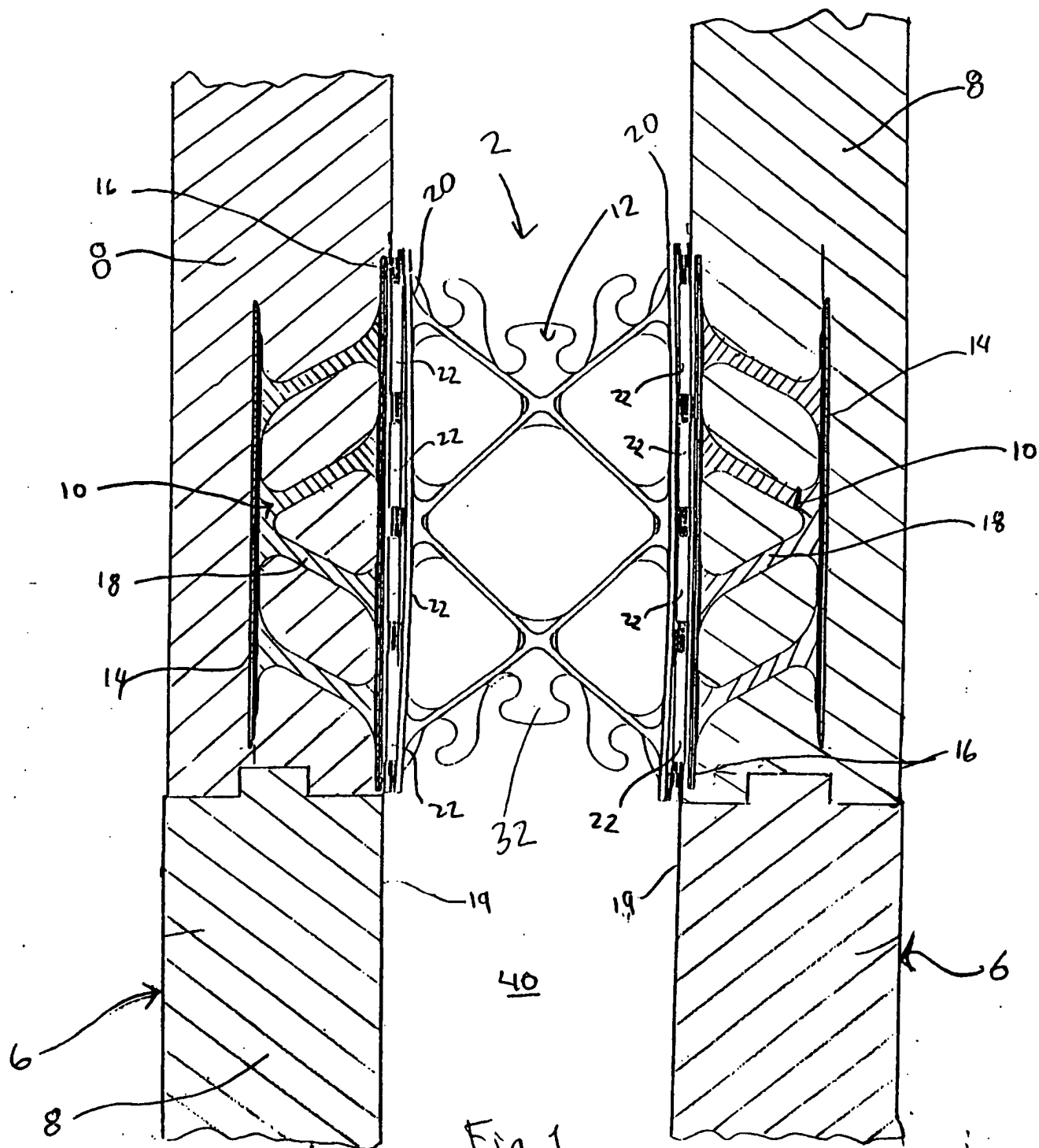
Referring to figure 8, the extremities of the cylindrical end portion (28) of the web member (12) preferably comprises a stopper (38) to prevent the web member (12) from sliding out of the knuckles once inserted therein.

The lateral bearing element (10) and the web member (12) are preferably made of plastic and as illustrated, the web member (12) has a shape adapted to receive and hold metal rods used to reinforce the concrete.

Finally, when the assembly of the form is completed, the empty cavity (40) existing between the form wall (8) made of isolating and rigid panels is filled with concrete or with cement based grout.

After hardening of the filling material, a composite wall is obtained with the isolating panels firmly attached through the connectors to the concrete inside-wall.

Although a preferred embodiment of the invention has been described in detail herein and illustrated in the accompanying drawings, it is to be understood that the invention is not limited to this precise embodiment and that various changes and modifications may be effected therein without departing from the scope or spirit of the invention.





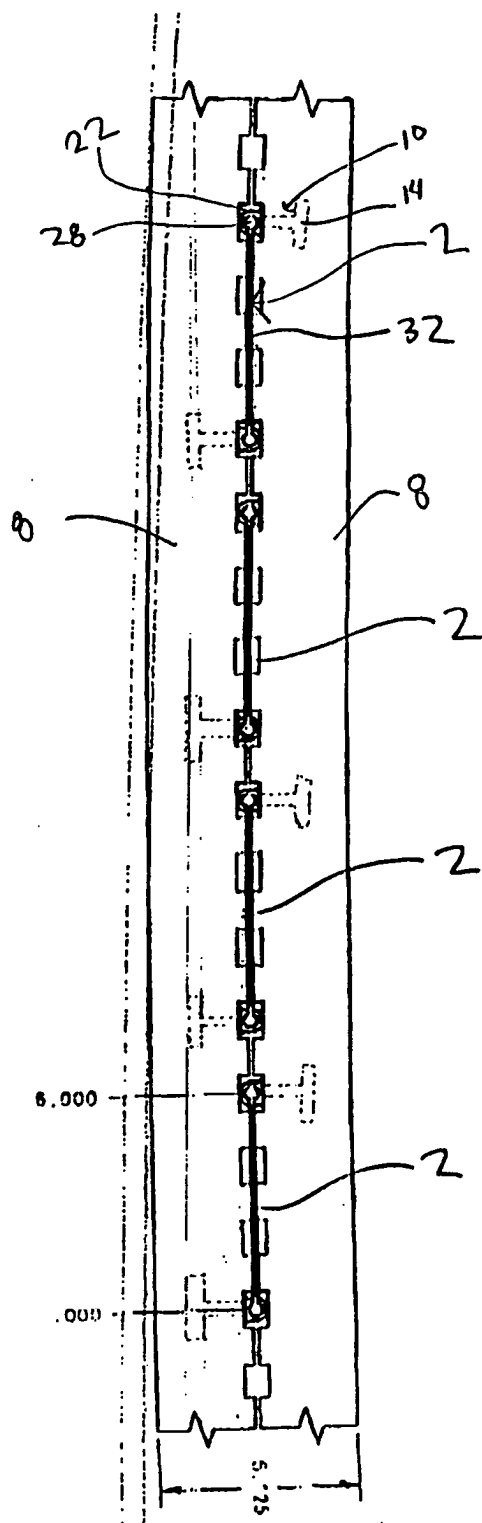
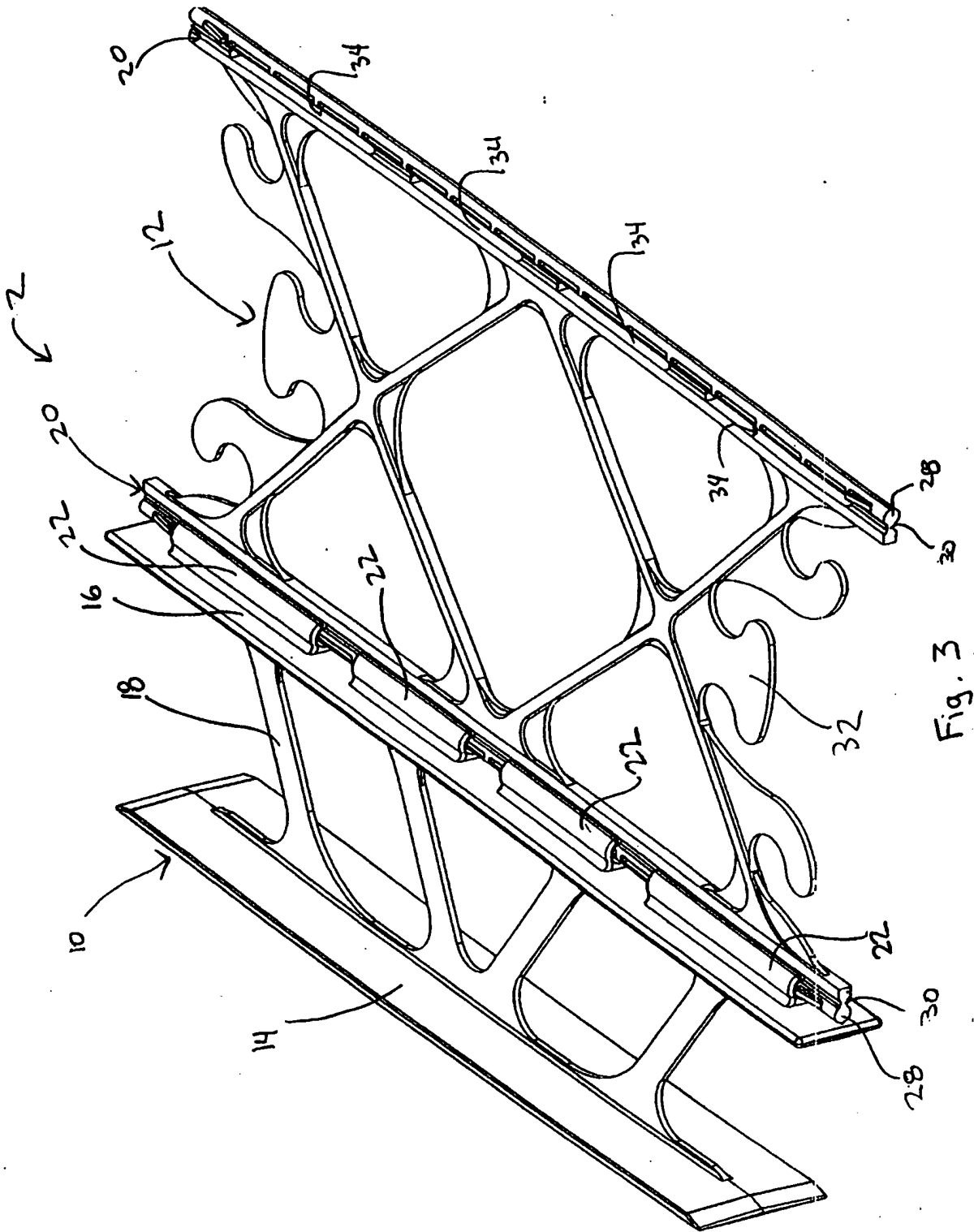
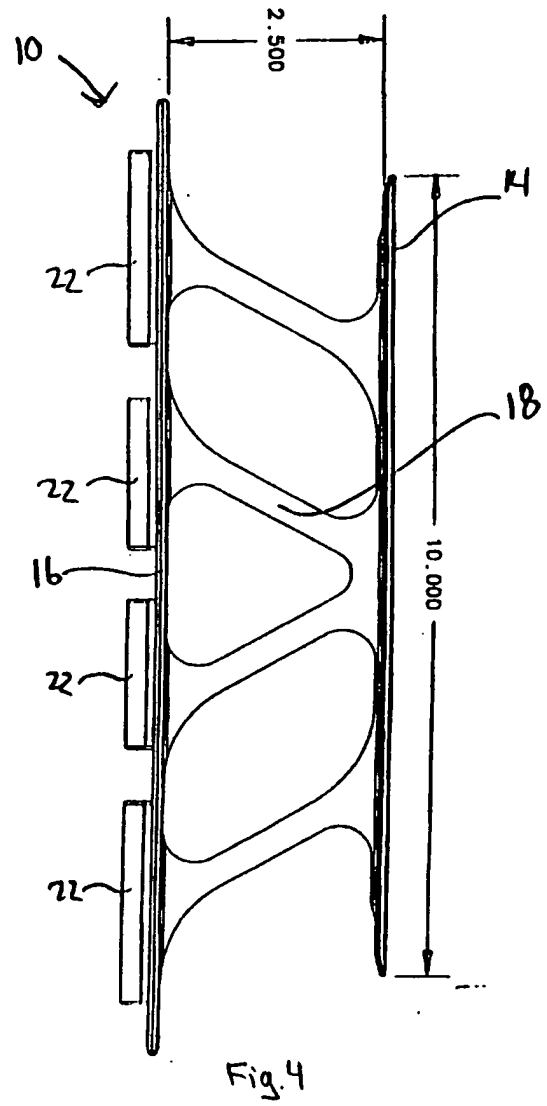
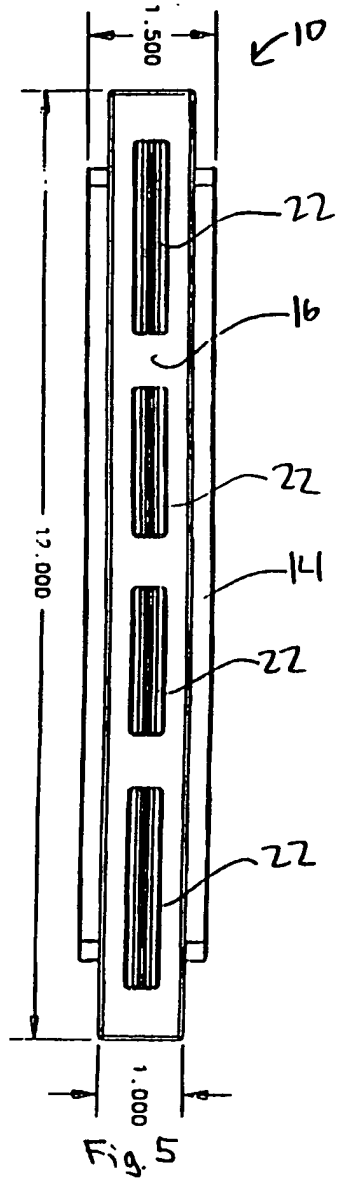


Fig. 2





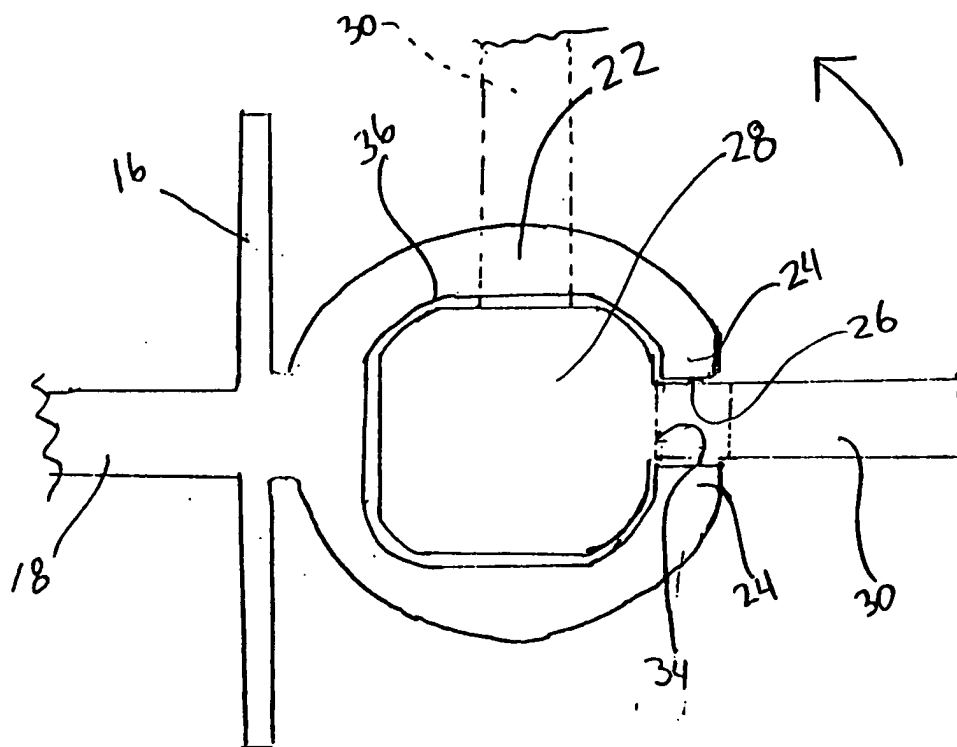
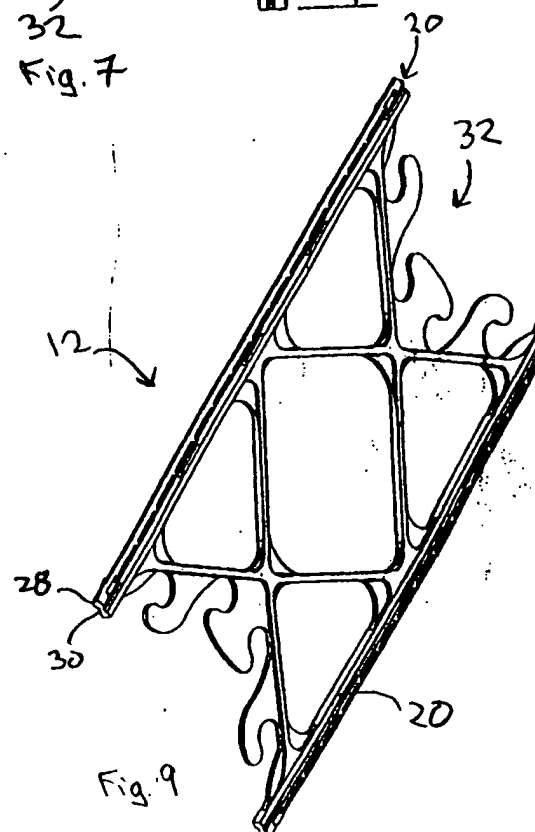
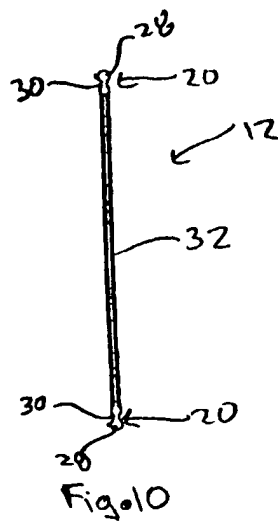
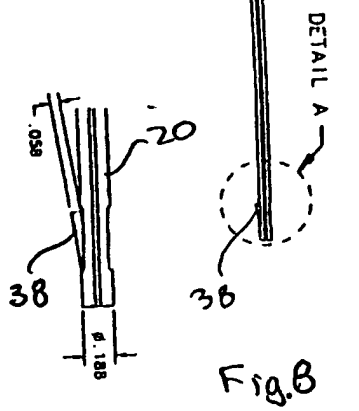
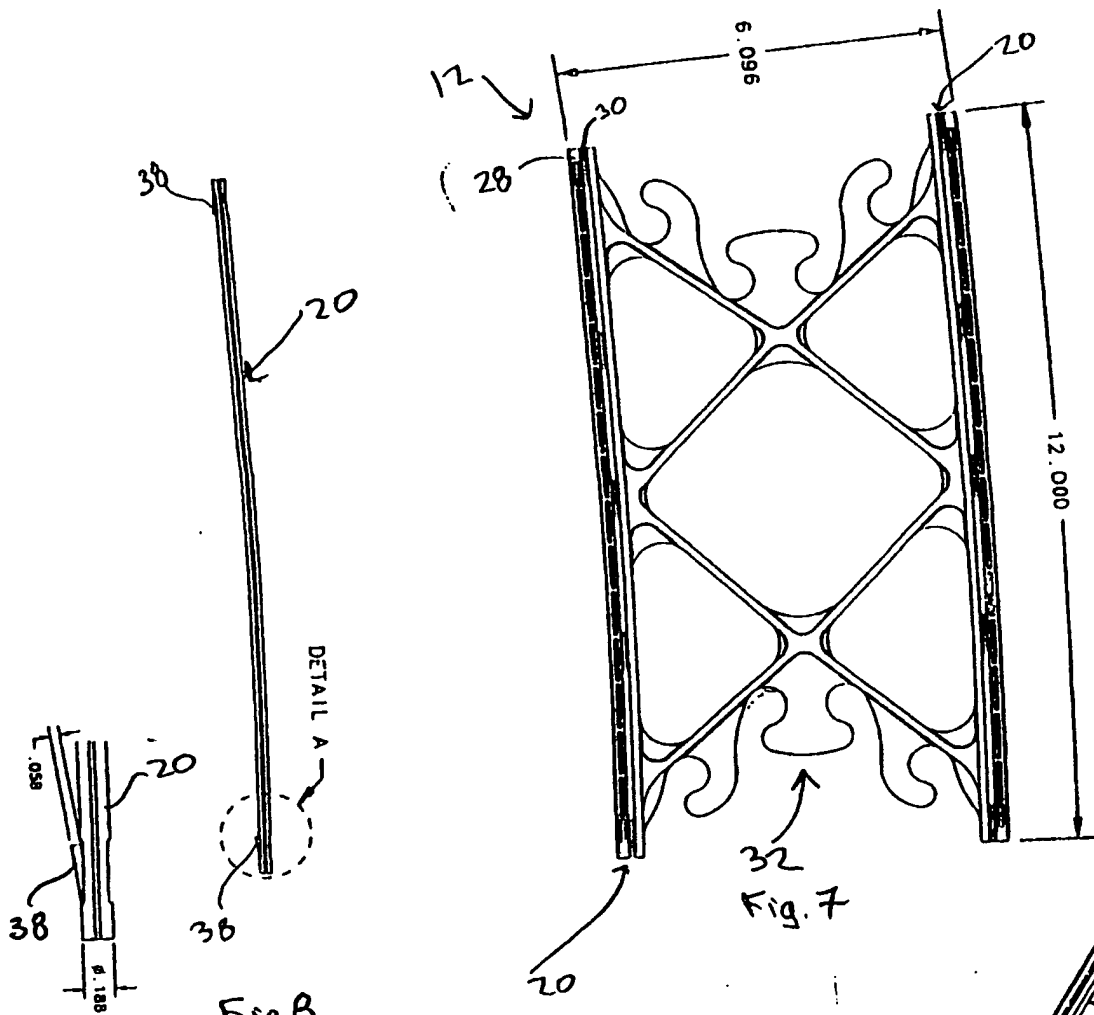


Fig. 6



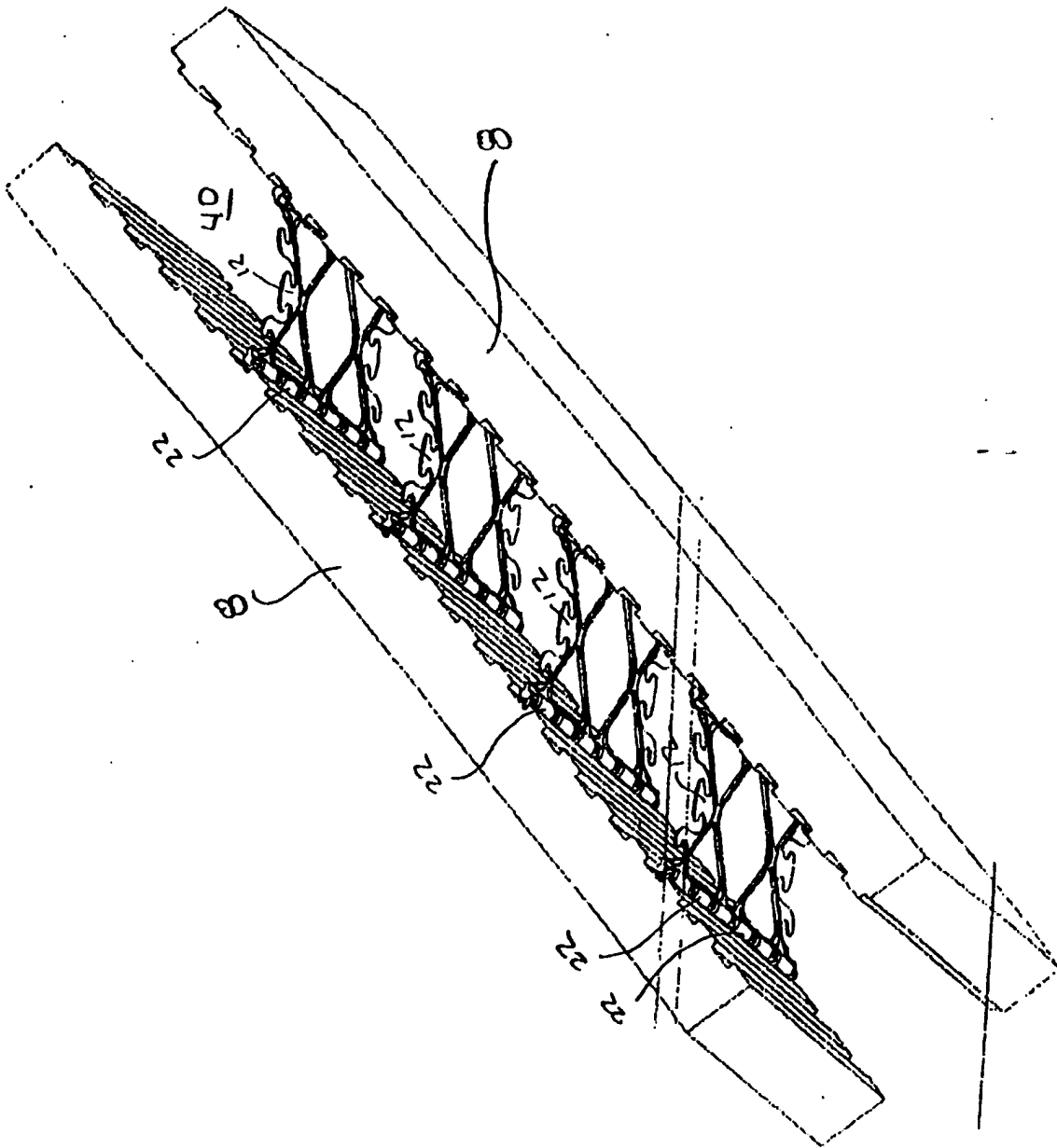


Fig. 11